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Patent
Atty. Docket: N-16,199B

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Ronda Finelli
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April 1, 2005

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant : C. SERBUTOVIEZ
Application No. : 09/877,312
Filing Date : June 8, 2001
For : PDLC CELL
Examiner : Sow Fun Hon
Art Unit : 1772

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

BRIEF ON APPEAL (37 C.F.R. 41.37(c))

Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on February 11, 2005. The fee of \$500.00 required under 37 CFR 41.20(b)(2) for a large entity accompanies this brief and is referred to in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains the following sections under the following headings, and in the order set forth below (37 CFR 41.37(c)):

- I REAL PARTY IN INTEREST;
- II RELATED APPEALS AND INTERFERENCES;
- III STATUS OF CLAIMS;
- IV STATUS OF AMENDMENTS;
- V SUMMARY OF CLAIMED SUBJECT MATTER;
- VI GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL;
- VII ARGUMENT;
- VIII CLAIMS APPENDIX.

I. REAL PARTY IN INTEREST (37 C.F.R. 41.37(c)(i))

The real party in interest in this appeal is U.S. Philips Corporation.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. 41.37(c)(ii))

There are no related appeals or interferences which would have any bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS (37 C.F.R. 41.37(c)(iii))

Claims 1-4 have been withdrawn.

Claims 5 and 7-9 have been finally rejected and are all on appeal.

Claim 6 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The objection appears in the final action dated December 10, 2004.

No claim has been allowed.

IV. STATUS OF AMENDMENTS (37 C.F.R. 41.37(c)(iv))

No amendments have been made after final rejection.

The claims on appeal are set forth in this Brief at Section VIII - CLAIMS APPENDIX.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. 41.37(c)(v))

With reference to the text and drawings of the specification, which are relied upon as part of the record to be considered, and as defined in the claims on appeal, the claimed subject matter is as follows:

Claim 5:

According to independent Claim 5, the invention is a polymerizable mixture which can suitably be used in a polymer-dispersed liquid crystal cell (page 7, lines 29-30; page 8, lines 1-6; Fig. 1 shows a polymer-dispersed liquid crystal cell), and comprises reactive monomers (page 7, line 30; page 8, line 1; Fig. 3) and a photoinitiator (page 7, lines 12-13), wherein the mixture contains two types of non-volatile reactive monomers (page 9, lines 23-35; ENPA and TDA in Fig. 3), the first type of monomer being an ethoxylated acrylate (page 7, line 30; ENPA in Fig. 3) and readily miscible with a liquid crystalline material (page 9, lines 26-27) and the second type of monomer (TDA in Fig. 3) being poorly miscible with said liquid crystalline material (page 9, lines 27-29).

Claim 9:

Independent Claim 9 calls for a display device (page 4, line 27; page 5, lines 27-30; page 6, line 1) comprising a polymer-dispersed liquid crystal cell (page 5, lines 18-26; Fig. 3) with a matrix of individually drivable rows and columns of electrodes as well as means for driving these electrodes (page 4, lines 28-30; page 5, line 1), characterized in that a cell is manufactured from a mixture, which predominantly comprises a liquid crystalline material

as well as two types of non-volatile, reactive monomers (page 9, lines 23-35; ENPA and TDA in Fig. 3), the first type of monomer being an ethoxylated acrylate (page 7, line 30; ENPA in Fig. 3) and readily miscible with the liquid crystalline material (page 9, lines 26-27) and the second type of monomer (TDA in Fig. 3) being poorly miscible with said liquid crystalline material and a photoinitiator (page 9, lines 27-29), wherein the mixture is sandwiched between two substrates, which are provided with an electrode layer (page 5, lines 19-22), and whereafter the mixture is polymerized under the influence of radiation (page 8, lines 5-6).

Support for Each Means-Plus-Function Element in Claim 9

- (i) Claim 9 calls for "...means for driving these electrodes."
- (ii) Page 5, lines 1-2 state that "the presence of the matrix of electrodes formed by said columns and rows enables pixels of the PDLC material of the display device to be driven locally by means of an electric voltage."

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. 41.37(c)(vi))

The issues of this appeal are as follows:

Whether Claims 5-7, and 9 are unobvious under 35 U.S.C. 103(a) over Japanese Patent JP 05019240 ("JP '240") to Masayuki.

VII. ARGUMENT

Claims 5-7 and 9 have been rejected under 35 U.S.C. §103, and arguments are presented in the following.

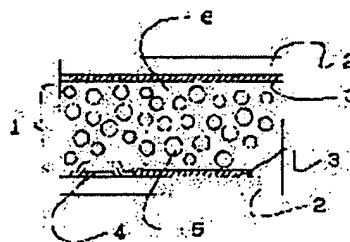
A. Introduction

Claims 5-7 and 9 have been rejected as being obvious to the person of ordinary skill in this art from that same reference.

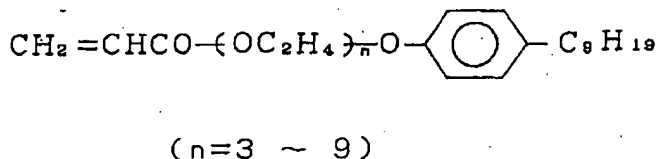
After considering the following, it is also believed the Board will agree that there is insufficient teaching in the reference to suggest the claimed invention.

B. The Prior Art - JP '240 to Masayuki

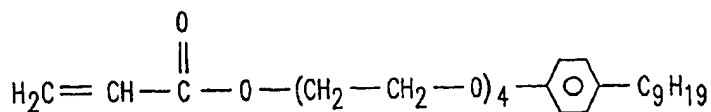
Masayuki teaches a liquid crystal display which comprises a polymer-dispersed liquid crystal (PDLC) cell (Abstract; paragraph 0015). The PDLC cell includes transparent electrodes 3, glass substrates 2, a driving element 4 such as a TFT or MIM (Abstract) and nematic liquid crystal material 5 dispersed in polymer matrix 6 (paragraph 0015).



The polymer matrix is formed by radical polymerization of a mixture of a small amount of photoinitiator and a monomer mixture (paragraph 0016). The monomer mixture includes an acrylate monomer, namely Nonyl-phenol EO denaturation acrylate of the formula shown to the right, and an



acrylic ester oligomer (paragraph 0016). The Nonyl-phenol EO denaturation acrylate is taught to be poorly miscible with the liquid crystalline material. (paragraph 0013). By contrast, in the present invention, the same ethoxylated acrylate monomer shown to the right, is



taught to be readily miscible with the liquid crystalline material. Finally, Masayuki teaches that the acrylic ester oligomer is readily miscible, or has good compatibility, with the liquid crystalline material. (paragraph

0013).

C. Discussion

Arguments Concerning Claims 5 and 9:

Independent claims 5 and 9 respectively define a polymerizable mixture for a PDLC cell containing a liquid crystalline material, a photoinitiator, and a mixture of monomers. The first monomer in the mixture is an ethoxylated acrylate monomer that is readily miscible with a liquid crystalline material. The second monomer is poorly miscible with the liquid crystalline material.

Applicant has previously argued in a response dated September 2, 2004 that Masayuki fails to teach an ethoxylated acrylate monomer that is readily miscible, as claimed in claims 5 and 9. The Office conceded this point in the Office Action dated December 10, 2004 by responding that "The ethoxylated acrylate monomer is taught to be poorly miscible (weak interaction) with the liquid crystal." Thus, the Office has conceded that an element of the claims is not taught and that Masayuki teaches the opposite of applicant's invention. That is, Masayuki teaches away from applicant's invention. The Office further stated that:

"Therefore a mixture of an ethoxylated acrylate monomer, which is instead readily miscible with the liquid crystal, coupled with an acrylate monomer, which is instead poorly miscible with the liquid crystal, is the result of routine experimentation by one of the ordinary skill in the art at the time the invention was made, within the realm of the invention of Masayuki, because it follows the same principle of a miscible/immiscible acrylate mixture which results in good control of the phase separation structure of the polymer dispersed liquid crystal."

A prior art reference should not be relied upon with the benefit of hindsight to show obviousness. Rather, a reference should be considered as a whole, and portions arguing against, or teaching away the claimed invention must be considered. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 USPQ 416 (Fed. Cir. 1986). Teaching away from the art is a *per se* demonstration of lack of prima facie obviousness. *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ 2d 1596 (Fed. Cir. 1988).

One skilled in the art having knowledge of Masayuki would be drawn away from using an ethoxylated acrylate monomer as a monomer readily miscible with a liquid crystalline material, since Masayuki expressly teaches such monomers as poorly miscible with a liquid crystalline material. One skilled in the art would not desire to perform routine experimentation since Masayuki leads one skilled in the art away from ethoxylated acrylate monomers as readily miscible monomers. It may seem to the Office that it would be obvious to use ethoxylated acrylate monomers as readily miscible monomers as a result of hindsight, since the Office has now read applicant's specification and is now aware of applicant's invention. However, one skilled in the art at the time of applicant's invention, having knowledge of Masayuki, would have lacked any incentive or expectation of success to use ethoxylated acrylate monomers as readily miscible monomers or to perform the routine experimentation that the Office suggests. The Office has not cited any reference that teaches or suggests the contrary.

Moreover, applicant respectfully submits that the relationship between an miscible/immiscible acrylate mixture and control of phase separation does not place use of an ethoxylated acrylate monomer (with good miscibility) within the scope of routine experimentation. The fact that a miscible and immiscible mixture of monomers may give good control of phase separation does not provide any motivation to specifically use an ethoxylated acrylate monomer with good miscibility in a PDLC cell. Whether it is obvious to try various acrylate monomers to find an ethoxylated acrylate monomer with good miscibility is not the standard for determining obviousness. *In re Geiger*, 815 F.2d at 688, 2 U.S.P.Q. 2d at 1278 (Fed. Cir. 1987).

Also, the fact that a miscible and immiscible mixture of monomers may give good control of phase separation does not teach or suggest that any particular ethoxylated acrylate monomer may even have good miscibility with liquid crystalline material. There are endless variations of ethoxylated acrylate monomers, based on structure and moles of ethoxylation. Thus, the experimentation that would be required to find an ethoxylated acrylate monomer that has good miscibility would be undue, particularly since the only prior

art that discloses ethoxylated acrylate monomers, teaches such a monomer as having poor miscibility with a liquid crystalline material. The Office has not provided any reference that teaches or suggests that ethoxylated acrylate monomers with good miscibility with a liquid crystalline material, were known in the art at the time of the invention. Thus, it is not clear how use of an ethoxylated acrylate monomer with good miscibility in a miscible/immiscible mixture could be deduced by routine experimentation. The search for the right combination of a liquid crystalline material and a monomer mixture in which an ethoxylated acrylate has good miscibility with the liquid crystalline material, is akin to a "search for a needle in a haystack."

In light of the above, applicant submits that the Office's rejection is impermissibly based on hindsight, since there is no teaching or suggestion of an ethoxylated acrylate monomer with good miscibility in the prior art. Hindsight reconstruction of prior art is not the applicable standard for providing evidence of obviousness. *Maschinenfabrik Rieter A.G. v. Greenwood Mills*, 340 F. Supp. 1103, 173 U.S.P.Q. 605, 610, 611 (S.C. 1972).

D. Conclusions

It is believed that from the foregoing, the following conclusions can be drawn:


1. That Masayuki never teaches or suggests an ethoxylated acrylate with good miscibility in a liquid crystalline material, as required by the claimed invention.
2. That Masayuki is solely concerned with an ethoxylated acrylate with poor miscibility in a liquid crystalline material, and therefore, teaches away from the claimed invention.
3. That one skilled in the art would not have any desire, motivation, or incentive to use an ethoxylated acrylate as a component of a PDLC mixture for having good miscibility with a liquid matrix since Masayuki specifically teaches an ethoxylated acrylate that has poor miscibility with a liquid matrix of a PDLC cell.
4. That one skilled in the art would only find undue experimentation, akin to "searching for a needle in a haystack," in attempting to discover an ethoxylated acrylate of

a monomer mixture that has good miscibility with the liquid crystalline material, since there is no evidence that it was even possible for an ethoxylated acrylate to have good miscibility with a liquid crystalline material.

Based on these conclusions, the claims on appeal are believed to be patentable over the prior art, and the application and claims are believed to be in condition for allowance.

The Board is, therefore, respectfully requested to reverse the Examiner's final rejection.

Respectfully submitted,


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Dated: April 1, 2005

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VIII. CLAIMS APPENDIX

Claim 5. A polymerizable mixture which can suitably be used in a polymer-dispersed liquid crystal cell, which mixture comprises reactive monomers and a photoinitiator, characterized in that the mixture contains two types of non-volatile reactive monomers, the first type of monomer being an ethoxylated acrylate and readily miscible with a liquid crystalline material and the second type of monomer being poorly miscible with said liquid crystalline material.

Claim 6. A polymerizable mixture as claimed in claim 5, characterized in that the first type of monomer is an ethoxylated alkyl-phenolacrylate whose alkyl group comprises at least five C-atoms, and in that the second type of monomer is an alkylacrylate whose alkyl group comprises at least 8 and maximally 18 C-atoms.

Claim 7. A polymerizable mixture as claimed in claim 5, characterized in that the quantity of each of the two types of monomers is at least 20 % by weight, calculated with respect to the overall quantity of both types of monomers.

Claim 8. A polymerizable mixture as claimed in claim 5, characterized in that a quantity of 70-90% by weight of a liquid crystalline material is added to the mixture.

Claim 9. A display device comprising:

a polymer-dispersed liquid crystal cell with a matrix of individually drivable rows and columns of electrodes as well as means for driving these electrodes, characterized in that a cell is manufactured from a mixture, which predominantly comprises a liquid crystalline material as well as two types of non-volatile, reactive monomers, the first type of monomer being an ethoxylated acrylate and readily miscible with the liquid crystalline material and the second type of monomer being poorly miscible with said liquid crystalline material and a

photoinitiator,

wherein the mixture is sandwiched between two substrates, which are provided with an electrode layer, and

whereafter the mixture is polymerized under the influence of radiation.



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Ronda Finelli
By: Ronda Finelli
Dated: April 1, 2005

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TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION-37 C.F.R. § 41.37)

Transmitted herewith is an APPEAL BRIEF in this application, with respect to the
Notice of Appeal filed on February 11, 2005.

1. STATUS OF APPLICANT

This application is on behalf of U.S. Philips Corporation, which is not a small
entity and which is the real party in interest.

2. FEE FOR FILING APPEAL BRIEF

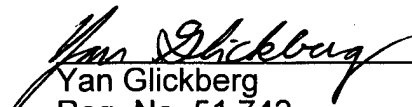
Pursuant to 37 C.F.R. §41.20(b)(2), the fee for filing the Appeal Brief in the

Amount of \$500 accompanies this Brief.

Entry of this Brief on Appeal is respectfully requested.

Dated: April 1, 2005

Respectfully Submitted,


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